

Pajaro Valley Watershed Integrated Regional Water Management Region Proposition 84 Planning Grant Application:
Budget

		Non-State Share (Funding Match \$)											Grant Request (DWR Grant Request)		Total	% Funding Match	
		SBCWD		SCVWD		PVWMA		FPA		County of Santa Cruz		EJCW		TOTAL			
		local or federal match	"in kind" contribution ⁴	local or federal match	"in kind" contribution ⁴	local or federal match	"in kind" contribution ⁴	local or federal match	"in kind" contribution	local or federal match	"in kind" contribution	local or federal match	"in kind" contribution		Task Hours	Task Budget	
Work Items																	
Task 1 Update Governance Section		\$0	\$1,680	\$0	\$5,400	\$0	\$1,680	\$0	\$0	\$0	\$0	\$0	\$8,760	40	\$7,600	\$16,360	
1.1	Formalize Stakeholder Steering Committee		\$960		\$2,400		\$960						\$4,320	8	\$1,520	\$5,840	284%
1.2	Develop Communication Plan		\$240		\$2,400		\$240						\$2,880	12	\$2,280	\$5,160	126%
1.3	Document Adaptive Approach for Future Revisions to the Plan		\$240		\$300		\$240						\$780	12	\$2,280	\$3,060	34%
1.4	Compile Governance Section		\$240		\$300		\$240						\$780	8	\$1,520	\$2,300	51%
Task 2 Update Region Description		\$0	\$360	\$0	\$450	\$0	\$360	\$0	\$0	\$0	\$0	\$0	\$1,170	64	\$12,160	\$13,330	
2.1	Update Region Description		\$360		\$450		\$360						\$1,170	32	\$6,080	\$7,250	19%
2.2	Compile Expanded Region Description Information												\$0	8	\$1,520	\$1,520	0%
2.3	Update and Develop New Maps in the Region Description												\$0	24	\$4,560	\$4,560	0%
Task 3 Update Plan Objectives		\$0	\$840	\$0	\$1,050	\$0	\$840	\$0	\$0	\$0	\$0	\$0	\$2,730	108	\$20,520	\$23,250	
3.1	Draft Updated Objectives		\$600		\$750		\$600						\$1,950	60	\$11,400	\$13,350	17%
3.2	Prioritize Objectives		\$240		\$300		\$240						\$780	40	\$7,600	\$8,380	10%
3.3	Finalize Revised Objectives and Objectives Prioritization												\$0	8	\$1,520	\$1,520	0%
Task 4 Develop Resource Management Strategies Sections		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	40	\$7,600	\$7,600	
4.1	Document process used to consider RMS in the Plan update												\$0	24	\$4,560	\$4,560	0%
4.2	Identify RMS that will be implemented and identify gaps												\$0	16	\$3,040	\$3,040	0%
Task 5 Prepare Project Review and Selection Section		\$0	\$480	\$20,000	\$600	\$0	\$480	\$0	\$0	\$0	\$0	\$0	\$21,560	164	\$31,160	\$52,720	
5.1	Document process for submitting a project for inclusion in the IRWM Plan												\$0	8	\$1,520	\$1,520	0%
5.2	Update Project Review Process		\$480		\$600		\$480						\$1,560	80	\$15,200	\$16,760	10%
5.3	Update Project List			\$20,000									\$20,000	60	\$11,400	\$31,400	175%
5.4	Develop and Implement Procedure for Communicating the List of Selected Projects												\$0	8	\$1,520	\$1,520	0%
5.5	Compile Project Review and Selection Section												\$0	8	\$1,520	\$1,520	0%
Task 6 Update Impacts and Benefits Section		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	56	\$10,640	\$10,640	
6.1	Review and update screening-level discussion of impacts and benefits												\$0	36	\$6,840	\$6,840	0%
6.2	Identify and analyze direct impacts and benefits affecting DAC, EJ concerns and Native American tribal communities												\$0	12	\$2,280	\$2,280	0%
6.3	Develop benchmark for assessing impacts and benefits												\$0	8	\$1,520	\$1,520	0%
Task 7 Update Plan Performance and Monitoring Section		\$0	\$240	\$0	\$300	\$0	\$240	\$0	\$0	\$0	\$0	\$0	\$780	56	\$10,640	\$11,420	
7.1	Review and Update Institutional Structure for IRWM Implementation Evaluation												\$0	8	\$1,520	\$1,520	0%
7.2	Explain how IRWM implementation will be tracked with a data management system (DMS) and who will be responsible for maintaining the DMS.												\$0	8	\$1,520	\$2,300	0%
7.3	Draft Plan Performance and Monitoring Section		\$240		\$300		\$240						\$780	40	\$7,600	\$7,600	10%
Task 8 Update Data Management Section		\$0	\$480	\$0	\$600	\$0	\$480	\$0	\$0	\$0	\$0	\$0	\$1,560	160	\$30,400	\$31,960	
8.1	Review Data Needs												\$0	40	\$7,600	\$7,600	0%
8.2	Assess Available Data Programs												\$0	40	\$7,600	\$7,600	0%
8.3	Establish DMS Protocol		\$480		\$600		\$480						\$1,560	80	\$15,200	\$16,760	10%
Task 9 Update Finance Section		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	40	\$7,600	\$7,600	
9.1	Draft IRWMP Finance Section and Finance Table												\$0	40	\$7,600	\$7,600	0%
Task 10 Update Technical Analysis Section		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	52	\$9,880	\$9,880	
10.1	Develop Technical Information Source Matrix												\$0	24	\$4,560	\$4,560	0%
10.2	Identify Data Gaps												\$0	12	\$2,280	\$2,280	0%
10.3	Develop Technical Analysis and Methods												\$0	8	\$1,520	\$1,520	0%
10.4	Prepare Updated Technical Analysis Section												\$0	8	\$1,520	\$1,520	0%
Task 11 Update Relation to Local Water Planning Section		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	36	\$6,840	\$6,840	
11.1	Update description of IRWM Plan relationship with local planning documents												\$0	36	\$6,840	\$6,840	0%
Task 12 Update Relation to Local Land Use Planning Section		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	32	\$6,080	\$6,080	
12.1	Identify links between the IRWM Plan and local land use planning												\$0	16	\$3,040	\$3,040	0%
12.2	Describe he current relationship between local land use planning entities and water management entities												\$0	8	\$1,520	\$1,520	0%
12.3	Describe future efforts to establish a proactive relationship between land use planning and water management												\$0	8	\$1,520	\$1,520	0%
Task 13 Update Stakeholder Involvement Section		\$0	\$960	\$0	\$1,200	\$0	\$960	\$0	\$0	\$0	\$0	\$0	\$3,120	40	\$7,600	\$10,720	
13.1	Expand description of the Stakeholder Steering Committee												\$0	8	\$1,520	\$1,520	0%
13.2	Elaborate on Stakeholder Involvement Tactics		\$960		\$1,200		\$960						\$3,120	16	\$3,040	\$6,160	103%
13.3	Elaborate on Stakeholder Involvement in Decision-making Process												\$0	8	\$1,520	\$1,520	0%
13.4	Update Stakeholder Involvement Section												\$0	8	\$1,520	\$1,520	0%
Task 14 Update Coordination Section		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	12	\$2,280	\$2,280	
14.1	Update Coordination Section to ensure consistency with Guidelines												\$0	12	\$2,280	\$2,280	0%
Task 15 Perform Climate Change Analyses		\$0	\$480	\$0	\$600	\$0	\$480	\$0	\$0	\$0	\$0	\$0	\$1,560	136	\$25,840	\$27,400	
15.1	Assess Climate Change Impacts and Regional Vulnerabilities												\$0	16	\$3,040	\$3,040	0%
15.2	Address Region Vulnerabilities in Plan Objectives		\$240		\$300		\$240						\$780	16	\$3,040	\$3,820	26%
15.3	Identify and Develop Regional Adaptation Strategies		\$240		\$300		\$240						\$780	16	\$3,040	\$3,820	26%
15.4	Prepare GHG Emissions Analysis for Implementation Projects												\$0	40	\$7,600	\$7,600	0%
15.5	Identify Triggers for Changing or Amending Plan in Response to Climate Change												\$0	24	\$4,560	\$4,560	0%
15.6	Identify Collaboration Opportunities												\$0	16	\$3,040	\$3,040	0%
15.7	Compile Climate Change Information												\$0	8	\$1,520	\$1,520	0%
Task 16 Watershed Study to Address Key Data Gaps ¹		\$0	\$0	\$0	\$0	\$0	\$0	\$68,000	\$0	\$0	\$0	\$0	\$68,000	590	\$112,100	\$180,100	
16.1	Program to Collect Sediment Concentration and Flow Data on the Pajaro and San Benito Rivers above their Confluence							\$38,000					\$38,000	390	\$74,100	\$112,100	51%
16.2	Update, Calibrate, and Re-Run the San Benito River Sediment Transport Model							\$30,000					\$30,000	200	\$38,000	\$68,000	79%

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Budget

														Grant Request (DWR Grant Request)		Total	% Funding Match
Non-State Share (Funding Match \$)														Task Hours	Task Budget		
SBCWD		SCVWD		PVWMA		FPA		County of Santa Cruz		EJCW		TOTAL					
local or federal match	"in kind" contribution ⁴	local or federal match	"in kind" contribution ⁴	local or federal match	"in kind" contribution ⁴	local or federal match	"in kind" contribution	local or federal match	"in kind" contribution	local or federal match	"in kind" contribution	local or federal match	"in kind" contribution				
Work Items																	
Task 17 Perform Salt and Nutrient Management Planning																	
17.1	Develop Salt and Nutrient Management Planning Stakeholder Committees in Each Study Area	\$30,000	\$0	\$10,000	\$21,600	\$10,000	\$4,080	\$0	\$0	\$0	\$0	\$0	\$0	\$75,680	1390	\$264,100	\$339,780
17.2	Document Conceptual Models	\$12,000		\$5,000	\$1,200	\$6,000	\$960							\$2,160	24	\$4,560	\$6,720
17.3	Identify Salt and Nutrient Sources	\$8,000			\$9,600	\$1,000	\$1,920							\$34,520	360	\$68,400	\$102,920
17.4	Salt and Nutrient Loading Analysis	\$10,000		\$5,000	\$240	\$3,000	\$960							\$9,240	120	\$22,800	\$32,040
17.5	Assimilative Capacity Estimate													\$23,760	450	\$85,500	\$109,260
17.6	Develop or Update Objectives Related to Recycled Water, Stormwater recharge and reuse, and other salt and nutrient management related issues				\$4,800									\$4,800	400	\$76,000	\$80,800
					\$1,200									\$1,200	36	\$6,840	\$8,040
Task 18 Implement Local Watershed Planning Process- College Lake Improvement and Watershed Management ²																	
18.1	Summarize Previous Work	\$0	\$0	\$0	\$0	\$0	\$0	\$75,000	\$65,000	\$0	\$0	\$10,000		\$10,000	10	\$1,900	\$11,900
18.2	Evaluate Water Supply Alternatives											\$25,000		\$25,000	586	\$111,340	\$136,340
18.3	Evaluate Flood Management Alternatives							\$25,000	\$20,000			\$50,000		\$70,000	120	\$22,800	\$92,800
18.4	Describe Benefits to IRWM Plan Implementation								\$15,000					\$15,000	350	\$66,500	\$81,500
18.5	Develop mechanism for watershed management								\$10,000					\$10,000	60	\$11,400	\$21,400
18.6	Contribute to Updates of IRWM Plan								\$10,000					\$10,000	85	\$16,150	\$26,150
Task 19 Engage Stakeholders in IRWM Plan Update																	
19.1	IRWM Plan Update workshops	\$0	\$5,280	\$25,000	\$6,600	\$0	\$5,280	\$0	\$0	\$0	\$0	\$0	\$0	\$42,160	396	\$75,240	\$117,400
19.2	Engage the Stakeholder Steering Committee in the IRWM Plan Update		\$1,920	\$25,000	\$2,400		\$1,920							\$31,240	100	\$19,000	\$50,240
19.3	Conduct Salt/Nutrient Management Plan Workshops		\$1,920		\$2,400		\$1,920							\$6,240	64	\$12,160	\$18,400
19.4	Public Notices		\$1,440		\$1,800		\$1,440							\$4,680	216	\$41,040	\$45,720
Task 20 Engage Disadvantage Communities in IRWM Plan Update ³																	
20.1	Review and Supplement Inventory of DACs and Native American tribes identified in the Pajaro IRWM region and develop Outreach Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$21,084	\$21,084	0	\$3,040	\$3,040	\$91,084
20.2	Conduct Focused Outreach Activities to Integrate DAC members and tribes into the IRWM Planning Process											\$10,000	\$10,000		\$4,000	\$14,000	\$250%
20.3	Provide Community Assistance for Project Preparation											\$11,084	\$11,084		\$29,000	\$40,084	\$38%
20.4	Provide Technical Assistance for Project Preparation											\$0	\$0		\$12,000	\$12,000	\$0%
Task 21 Compile Updated IRWM Plan																	
21	Compile Updated IRWM Plan	\$0	\$1,920	\$0	\$2,400	\$0	\$1,920	\$0	\$0	\$0	\$0	\$0	\$0	\$6,240	40	\$25,000	\$31,240
Task 22 Project Management																	
22.1	Ongoing Grant Management	\$0	\$12,000	\$15,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,240	40	\$25,000	\$31,240
22.2	Agreements		\$7,200	\$5,000										\$12,200		\$0	\$12,200
22.3	Quarterly Reports		\$4,800	\$5,000										\$9,800		\$0	\$9,800
22.4	Final Report			\$5,000										\$5,000	80	\$15,200	\$20,200
TOTALS:																	
		\$30,000	\$24,720	\$70,000	\$40,800	\$10,000	\$16,800	\$68,000	\$0	\$75,000	\$65,000	\$0	\$21,084	\$421,404	1156	\$996,170	\$1,417,574

Notes:

1. The costs for completing the Task 16 Watershed Study were based on a fee estimate developed by a consulting firm. This firm completed earlier phases of the study and is very familiar with the area, data needed, and level of effort required to complete the study. Attached is a memorandum summarizing the workplan, estimated fee, and schedule for completing the study. Also attached is a letter from the US Army Corps of Engineers expressing the federal interest in a study and the federal 50% cost match. It is important to note that only the first two tasks of the study are included in the IRWM Plan Update activities.

2. The costs for completing the Task 18 Local Watershed Planning Process were based on level of effort estimates from each of the agencies participating in the process. The estimates are based on the availability of a significant number of existing studies already prepared by one of the partner agencies, PVWMA. The non-state share is based on work completed since September 2008 on the effort and a commitment from the partner agencies to provide in-kind services through completion of the process.

3. The costs for completing Task 20 Engage Disadvantaged Communities were based on similar efforts throughout the State by the Environmental Justice Coalition for Water. The costs reflect some of the work that has already been done to identify, engage and support disadvantaged communities in the Pajaro River Watershed while recognizing that additional work must be done to meet the needs of these communities. The supporting budget documentation provided by EJCW is attached.

4. Hourly rates for "in kind" contribution for SBCWD and PVWMA are \$120 per hour. Hourly rates for "in kind" contribution for SCVWD is \$150 per hour.

Pajaro Valley Watershed Integrated Regional Water Management Region Proposition 84 Planning Grant Application:

Budget Supporting Information

- 1) Budget Summary Table
- 2) Letter from the US Army Corps of Engineers regarding cost sharing for Task 18:
Watershed Study to Address Key Data Gaps (FPA Study)
- 3) Background Scope and Budget information for Task 18: Watershed Study to Address Key
Data Gaps (FPA Study)
- 4) Environmental Justice Coalition for Water—Disadvantaged Communities Budget
Description

<u>Grant Request Totals</u>	
Salt and Nutrient Management Plans (3 basins)	\$305,140
Watershed Study to Address Key Data Gaps (FPA)	\$112,100
College Lake Watershed Management (Santa Cruz)	\$230,090
DAC Outreach and Engagement (EJCW)	\$70,000
IRWM Plan Update	\$278,840
Total request	\$996,170



DEPARTMENT OF THE ARMY
SAN FRANCISCO DISTRICT, U.S. ARMY CORPS OF ENGINEERS
1455 MARKET STREET
SAN FRANCISCO, CALIFORNIA 94103-1398

Correspondence Item 10.B.1

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March 13, 2008

Viet REPLY TO
ATTENTION OF

Mr. Nick Papadakis
Executive Coordinator
Pajaro River Watershed Flood Prevention Authority
P.O. Box 809
Marina, California 93933

Dear Mr. Papadakis,

Thank you for your letter of February 25, 2008 stating the Pajaro Watershed Flood Prevention Authority's (FPA's) interest in participating in the Pajaro River Watershed Study (the study) as the non-Federal sponsor. We look forward to working with you and understand that your specific interests are currently along the San Benito River and that your role needs to be consistent with AB807.

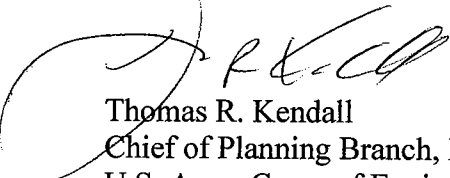
Please note that, from the Corps's perspective, the scope of the study is still very open and is subject in large part to the desires of your organization as the local sponsor. The study can examine traditional Corps mission areas such as flood risk management and ecosystem restoration with a goal of identifying a Federal interest in implementation of projects. Alternatively, the study can be used to look at broader planning issues, including those where the Corps is less likely to be a cost-sharing participant in implementation, for example, ground-water recharge and water supply. The decision is your; so we will need to learn more about where you would like to see the study focus.

Unfortunately, we do not have funding in the current (Fiscal Year 2008) budget for this effort. However, if you would like, we can investigate nominal reprogramming of Federal funds to potentially accomplish a first phase scope (Project Management Plan) and the signing of a partnership agreement. This would be attempted as soon as practicable in anticipation of Federal and state appropriations in a subsequent fiscal year to begin the 50-50 cost-shared basin feasibility study in earnest. Please note that any reprogramming request would require approval of the Congressional Appropriations committee and that, absent appropriations, our involvement will need to be very limited.

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Again, we look forward to partnering with you on this study. If you have any questions on appropriations or other matters, please do not hesitate to call me at 415-503-6822 or Nicole Ortega at 415-503-6734.

Sincerely,

A handwritten signature in black ink, appearing to read 'T. R. Kendall', is written over the printed name and title.

Thomas R. Kendall
Chief of Planning Branch, ETS
U.S. Army Corps of Engineers

DRAFT MEMORANDUM

Date: December 28th 2009
To: John Doughty
CC: Lidia Gutierrez and Bruce Leclergue
From: Andrew Collison
PWA Project #:
Subject: **Pajaro Watershed Flood Prevention Authority scope of work**

The following is a draft scope of services, deliverables list, schedule and fee estimate for completing additional watershed studies in the Pajaro River Watershed. The scope, fee, and schedule shall be used by the Pajaro River Watershed Flood Prevention Authority (FPA) to support the federal appropriations process with the Army Corps of Engineers and the pursuit of grant funding opportunities with the State of California to perform the additional watershed studies.

The FPA has completed several flood and sediment studies that provided insights into how sediment is eroded, transported and deposited in the Pajaro River watershed; however, these studies highlighted data gaps that are the subject of this scope of work. The additional studies will focus on developing a better understanding of sediment issues and the cost and benefits of solutions in the watershed. The additional studies and projects involve calculating and managing sediment load and peak flows from the upper watershed into the lower Pajaro River. The five recommended studies include:

1. Calibration of the San Benito River sediment transport model based on observed erosion between 1987 and 2000.
2. Establishing a program to collect sediment concentration and flow data on both the Pajaro River and the San Benito River above their confluence, so that an accurate sediment budget for the two river systems can be developed.
3. Performing an opportunities and constraints assessment for erosion reduction on the lower San Benito River (between Hollister and the confluence with the Pajaro River). The assessment will focus on arresting potential knickpoints that may migrate upstream, and on stabilizing the banks and bed of the San Benito River.
4. Development of a two-dimensional sediment transport model for the entire Lower Pajaro River Levee Reconstruction Project reach (from the Chittenden gage to the Pacific Ocean).
5. Performing an opportunities and constraints assessment for peak flow reduction on the San Benito River. The assessment will focus on identifying opportunities to detain water before it reaches the Pajaro River, reducing the flood peak for the downstream Lower Pajaro River Levee Reconstruction Project.

These items are described in more detail on the following pages.

1. UPDATE, CALIBRATE AND RE-RUN THE SAN BENITO RIVER SEDIMENT TRANSPORT MODEL

Phil Williams & Associates (PWA 2005) developed a one-dimensional hydraulic and sediment transport model (HEC-6T) for the San Benito River from a point 0.7 miles upstream of the confluence with the Pajaro River, to Lane Road in Hollister (11.5 miles upstream). The model was used to identify aggrading and eroding reaches and to assess sediment load from the San Benito River to the Pajaro River. The study identified several data gaps that this scope of work will fill:

- The model stopped short of the confluence with the Pajaro River due to a gap in high resolution topographic data between the Pajaro River and the downstream boundary of the San Benito River sediment transport model;
- An estimated sediment input had to be used at the upstream boundary due to the lack of data (a sediment rating curve) on the San Benito River or the Pajaro River upstream of the confluence to calibrate the model (there is sediment data from the USGS gage at Chittenden, downstream of the confluence); and
- Cross section data (from 1987 and 2000) are available that could be used to validate and potentially calibrate the model by comparing predicted and observed erosion and sedimentation trends, but this has not currently been performed.

Primary Objectives and Benefits

The model will allow the FPA to calculate sediment delivery from the San Benito River to the Lower Pajaro River more accurately. An accurate estimate of sediment delivery is needed to plan for and manage sediment within the flood prone area around Watsonville and Pajaro, and to prioritize sediment management actions in the upper watershed.

Scope of Work

1. Conduct topographic surveying of the confluence of the Pajaro and San Benito Rivers to extend the San Benito River sediment transport model to the confluence. The 2005 one-dimensional hydraulic and sediment transport model stopped 0.7 miles short of the confluence due to topographic data gaps. The consultant will carry out a topographic survey of the channel in this reach of the San Benito River, producing a cross section at least every 250 feet on average (assume 20 cross sections total).
2. Extend the existing sediment transport model to the confluence of the Pajaro River (total extent from the confluence of the Pajaro River to Lane Road, Hollister). The cross sections will be used to extend the existing HEC-6T model. The consultant may choose to convert the existing model from HEC-6T to HEC-RAS using the sediment transport module of HEC-RAS. The model shall be set up to simulate a movable bed system with a mixed particle size distribution (primarily sand and gravel).
3. Validate and calibrate the model using the observed changes in channel cross section between 1987 and 2000.

4. Re-run the model to calculate the sediment load from the San Benito River to the Pajaro River using continuous flow records from the USGS gage at Hollister from 1970 to the present.

Deliverables

- Topographic survey supplied in electronic form (AutoCAD)
- 20 cross sections for export to a hydraulic model (X, Z data in feet)
- HEC-RAS or HEC-6T hydraulic and sediment transport model with associated input and output files
- Draft and Final Technical Memo describing the model set up, calibration and validation using channel cross section data from 1987 to 2000, and simulation of conditions from 1970 to present. The memo should include estimates of annual sediment load from the San Benito River to the Pajaro River, identify trends if present, and identify areas of erosion and deposition in the river.
- Presentation of Draft Technical Memo to the FPA and the USACE at up to two meetings (additional meetings to be added as an optional extra task if required).

Estimated Duration

- Topographic Surveying – Three months from Notice to Proceed (NTP)
- Hydraulic model set up and simulation – Six months from NTP

Estimated Fee

- Topographic Survey ~\$20,000
- Extend sediment transport model ~ \$15,000
- Validate and calibrate based on historic topographic data ~ \$15,000
- Re-run model to simulate period of record ~ \$15,000
- Meetings and meeting preparation ~ \$5,000
- **Total ~ \$70,000**

2. A PROGRAM TO COLLECT SEDIMENT CONCENTRATION AND FLOW DATA ON BOTH THE PAJARO RIVER AND THE SAN BENITO RIVER ABOVE THEIR CONFLUENCE

Primary Objectives and Benefits

The data collection will allow the FPA to calculate relative sediment delivery rates from the Upper Pajaro River and the San Benito River to the Lower Pajaro River. An accurate estimate and partition of sediment yield is needed to plan for and manage sediment within the flood prone area around Watsonville and Pajaro, and to prioritize sediment management actions in the upper watershed.

Scope of Work

1. Install a flow gage on each of the Pajaro River and the San Benito River around Highway 101.
2. Develop a flow rating curve for the cross section.
3. Conduct automatic flow rate sampling (15 minute intervals) and necessary gage maintenance for a period of 3 years.
4. Conduct event-based sediment and flow sampling on the Pajaro River and the San Benito River upstream of the confluence to:
 - a. Establish a sediment rating curve,
 - b. Calculate sediment loadings, and
 - c. Calculate relative sediment contributions from both rivers.

The sampling should consist of suspended load (Total Suspended Sediment), bed load and discharge at a range of flows on both rivers.

Deliverables

- Two installed flow gages with depth sensor and data logger
- Technical Memo and presentation to FPA and USACE describing the flow rating curve and instrument set up for each site
- Flow data to be provided to the FPA quarterly within one month of the end of the quarter
- Annual Draft and Final Technical Memo with all flow and sediment transport data
- Annual presentation of results and conclusions to FPA and USACE

Estimated Duration

- Flow Gage Installation – Three months from NTP
- Technical Memo describing set up and rating curve – end of first rainy season (June, assuming project starts in fall or winter)

Estimated Fee

- Equipment purchase and installation ~ \$20,000
- Yearly maintenance and monitoring ~ \$45,000
- Event monitoring and rating curve development ~ \$35,000 Technical Memo ~ \$10,000
- **Total ~ \$110,000 for 1st year, ~ \$200,000 over 3 years**

3. OPPORTUNITIES AND CONSTRAINTS ASSESSMENT FOR EROSION REDUCTION ON THE SAN BENITO RIVER

The assessment will focus on arresting potential knickpoints that may migrate upstream, and on stabilizing the banks and bed of the San Benito River.

Primary Objectives and Benefits

The San Benito River is believed to be the main source of sediment that is restricting flood conveyance in lower Pajaro River, and thus sediment reduction in the San Benito River watershed has the potential to reduce flood damages downstream. This study will identify the main sediment sources within the watershed downstream of Hollister and identify conceptual alternatives and conceptual level cost estimates to treat and reduce sediment. This will allow cost-benefit comparisons to be made between treating sediment at source and removing sediment from the lower Pajaro River.

Scope of Work

1. Using the flow data at Hollister and data collected under the San Benito River sediment transport study (above), determine how much of the sediment transported from the San Benito River to the Pajaro River originates from upstream of Hollister and how much from downstream.
2. Based on the results of step 1, prioritize field and aerial photo assessments of major erosion sources that can be effectively treated to reduce sediment loading to the river. These sources are anticipated to include eroding banks, knick points and landslides adjacent to the channel.
3. Conduct a sediment trapping opportunities assessment. Opportunities may include potential sediment retention basins and floodplain areas.
4. Develop a prioritized list of conceptual treatments for at least the top ten erosion sources or opportunities to trap sediment, including a description of the feature, map showing locations, ownership, estimated volume of sediment eroded or that could be trapped per year, conceptual treatment, conceptual cost estimate.

Deliverables

- Draft and Final Technical Memo describing the sediment reduction opportunities and constraints along the San Benito River
- Presentation to FPA and USACE of results and conclusions

Estimated Duration

- Draft Technical Memo - Six months after NTP
- Final Technical Memo – Nine months after NTP

Estimated Fee

- Fieldwork and Technical Memo ~ \$80,000

4. A TWO-DIMENSIONAL SEDIMENT TRANSPORT MODEL OF THE PAJARO RIVER FROM CHITTENDEN GAP TO THE OCEAN

Primary Objectives and Benefits

A two-dimensional sediment transport model will allow the FPA to evaluate the proposed project alternatives for erosion and deposition characteristics, including assessment of meander bends, setbacks, floodplain benches, and the effects of vegetation management. It will also allow assessment of long term issues such as the effects of sea level rise on the Lower Pajaro River Levee Reconstruction project's performance.

Scope of Work

1. Construct a two-dimensional hydraulic and sediment transport model for the Pajaro River from Chittenden gage to the Pacific Ocean (approximately 16 miles).
2. Conduct sediment sampling on the Pajaro River to characterize bed material.
3. Simulate the existing and proposed conditions (up to three alternatives) for the proposed Lower Pajaro River Levee Reconstruction Project to evaluate sediment deposition and erosion rates and locations.

Deliverables

- Input and output files for two-dimensional sediment transport model
- Draft Technical Memo describing the model set up and evaluating existing and proposed conditions for sediment erosion, transport and deposition, as well as anticipated sediment removal requirements under the proposed Lower Pajaro River Levee Reconstruction project
- Presentation of Draft and Final Technical Memo to FPA and USACE
- Participation in five meetings to provide technical input (additional meetings to be funded separately if required)
- Final Technical Memo

Estimated Duration

- Draft Technical Memo – Six months from NTP
- Final Technical Memo – Nine months from NTP

Estimated Fee

- Model development and Technical Memo ~ \$100,000
- Meeting preparation and participation ~ \$15,000
- **Total ~ \$115,000**

5. OPPORTUNITIES AND CONSTRAINTS ASSESSMENT FOR PEAK FLOW REDUCTION ON THE SAN BENITO RIVER

The assessment will be a spatial (GIS) and hydrologic (rainfall-runoff model) assessment identifying opportunities to detain water before it reaches the Pajaro River, reducing the flood peak for the Lower Pajaro River Levee Reconstruction project.

Primary Objectives and Benefits

The San Benito River represents more than half the watershed area of the Pajaro River at their confluence, and is a major source of peak flows in the lower Pajaro River floodplain. Finding opportunities to detain water in the upper watershed will reduce the frequency and depth of inundation downstream.

Scope of Work

1. Identify flood-reduction screening criterion. The consultant shall identify a general flood reduction target (percentage reduction and relevant flood event frequency) for use as an initial screening criterion to evaluate the effectiveness of potential storage locations.
2. Conduct modeling exercise to evaluate potential locations. Using an appropriate watershed hydrology model (e.g. HEC-HMS), the consultant shall investigate the potential effectiveness of detention at various locations in the watershed.
3. Identify a minimum facility volume. Based on the investigation above, the consultant shall identify an approximate minimum facility volume needed to meet the preliminary flood reduction target.
4. Screen out infeasible areas. Using spatial analysis along with the minimum facility volume, the consultant shall screen out areas that are too far upstream to detain the minimum required flood volume, heavily developed, too far from stream channels to permit water transfer to a facility under gravity, or topographically unable to reasonably accommodate the required storage volume.
5. Focus site-specific investigation in remaining zone. The consultant shall look for opportunities for flood detention within the remaining zone. Once potential locations have been identified, consultant shall perform modeling using site-specific parameters (i.e. stage-storage relationships, inflow hydrographs, potential detention structure configuration) to evaluate facility performance and flood reduction potential.
6. Recommend a facility location. Using the hydrology modeling results, the consultant shall recommend a location that best meets the flood-reduction target. The consultant may also recommend methodologies to rank feasible alternatives.

Assumptions

It is assumed that the rainfall-runoff HEC-1 model developed by the FPA for the Pajaro River Watershed Study will be available.

Deliverables

- Updated HEC-HMS model for the San Benito River Watershed with all input and output files
- GIS input and output files used in the analysis
- Draft Technical Memo describing the screening process and conclusions, including a description of suitable detention sites, flood reduction potential, conceptual approach to detention and conceptual cost estimates
- Final Technical Memo
- Presentation of results to FPA and USACE
- Participation in five meetings to provide technical input (additional meetings to be funded separately if required). (Note: this may be combined with Task 4 for cost savings.)

Estimated Duration

- Draft Technical Memo – Six months from NTP
- Final Technical Memo – Nine months from NTP

Estimated Fee

- Modeling and Technical Memo ~ \$75,000
- Meeting participation ~ \$15,000
- **Total ~ \$90,000**

SCHEDULE AND PRIORITIZATION OF TASKS

All tasks may start simultaneously using existing data, though data from Task 2 will provide information for subsequent sediment transport studies such as follow on work for Task 4. Work may be phased to facilitate funding or workloads.

Priorities have been focused on tasks that are most likely to provide ‘actionable’ data for the FPA to reduce flood risk downstream, lower O&M costs and enhance the design of the USACE Lower Pajaro River Levee Reconstruction project. These priorities are as follows:

Priority 1. Task 4 Development of a two-dimensional sediment transport model. This task will feed most directly into the flood project design process and provide the FPA with technical input on different design refinements, as well as O&M issues such as where sediment will require removal, effects of sea-level rise on the project in future etc.

Priority 2. Task 5. Opportunities and constraints assessment for peak flow reduction. This task will seek to identify locations where flows can be reduced by upstream detention, directly benefiting the downstream communities.

Priority 3. Task 3. Opportunities and constraints assessment for erosion and sediment reduction.

This task will seek to identify opportunities to reduce sediment inputs into the Pajaro River, lowering the need for O&M and maintaining flood conveyance downstream.

Priority 4. Task 2. Sediment data collection. This task will inform long term planning for the watershed by providing data on sediment movement through the Pajaro and San Benito Rivers.

Priority 5. Task 1. Extend and calibrate San Benito River sediment model. This task will quickly plug a gap in the sediment transport data and provide a long term estimate of sediment inputs from the San Benito River to the Pajaro River.



Task	Cost	Task Priority	Month from Notice to Proceed											
			1	2	3	4	5	6	7	8	9	10	11	12
1. Update, calibrate and re run the San Benito River sediment transport model	\$ 70,000	5												
2. A program to collect sediment concentration and flow data on both the Pajaro River and the San Benito River above their confluence	\$110,000 (\$200,000)	4												
3. Opportunities and constraints assessment for erosion reduction on the San Benito River	\$ 80,000	3												
4. a Two-dimensional sediment transport model of the Pajaro River from Chittenden to the ocean	\$115,000	1												
5. Opportunities and constraints assessment for peak flow reduction on the San Benito River	\$ 90,000	2												

Environmental Justice Coalition for Water
DAC Outreach
BUDGET DESCRIPTION

Total time-frame for completion of sub-contract: 18 months from signing of the contract.

Total budget requested for completion of sub-contract: \$70,000

- 1) EJCW Northern California Program Director cost: \$27,300

The rate is \$70/ hour (includes overheads).

5 hours/ week X 52 weeks/ year X 1.5 years = \$27,300

- 2) EJCW Central Coast Organizer: \$18,720

The rate is \$30/ hour.

8 hours/ week X 52 weeks/ year X 1.5 years = \$18,720

- 3) Transport costs: \$12,340 for 1.5 years

EJCW reimburses mileage at the federal rate of \$0.50/ mile for a privately owned vehicle. For a rental car, EJCW reimburses up to the cost of an economy car (or van if more than 4 people are being transported), along with fuel costs. In addition, cost of public transit, parking and tolls are reimbursed. Food and lodging are reimbursed when required.

- 4) Translation of documents into Spanish: \$1400

Translation costs \$0.10/ word X 700 words/ flier approx. X 20 fliers = \$1400 approx

- 5) Copying and printing of outreach materials: \$1,740 for 1.5 years

- 6) Meeting expenses: \$2500

- 7) Conference calls: \$1000

- 8) Technical Assistance/ cost of Consultant Engineers: \$5000